SEQUENCE LISTING

<110>   KAO CORPORATION

<120>   Alkaline Protease

<130>   FP-KS-0498

<150>   JP 09-274570
<151>   1997-10-07

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<212>   PRT
<213>   *Bacillus sp.*

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<221>   misc_feature

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         148. 160. 165. 172. 183. 187. 188. 189. 194. 286. 306. 324. 369. 431. 501.
         531. 541. 584. 591. 592. 594. 595. 596. 611. 632

<223>   Xaa=arbitraty amino acid

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Met Arg Lys Lys Lys Val Phe Leu Ser Val Leu Ser Ala Ala Ala Ile
1   5   10   15

Leu Ser Thr Val Ala Leu Xaa Asn Pro Ser Ala Gly Xaa Ala Arg Xaa
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Phe Asp Leu Asp Phe Lys Gly Ile Gln Thr Thr Thr Asp Xaa Xaa Gly
              35   40   45

Phe Ser Lys Gln Xaa Gln Thr Gly Ala Ala Ala Phe Leu Val Glu Ser
          50   55   60

Glu Asn Val Lys Leu Xaa Lys Gly Leu Xaa Lys Lys Leu Glu Thr Val
65   70   75   80

Pro Ala Asn Asn Lys Leu His Ile Xaa Gln Phe Asn Gly Pro Ile Leu
              85   90   95

Glu Glu Thr Lys Gln Xaa Leu Glu Xaa Thr Gly Ala Lys Ile Leu Asp
              100   105   110

Tyr Ile Pro Asp Tyr Ala Tyr Ile Val Glu Tyr Glu Gly Asp Val Xaa
              115   120   125

Ser Xaa Xaa Xaa Xaa Ile Glu His Val Glu Ser Val Glu Pro Tyr Leu
130   135   140

Pro Xaa Tyr Xaa Ile Asp Pro Gln Leu Phe Thr Lys Gly Ala Ser Xaa
145   150   155   160

Leu Val Lys Ala Xaa Ala Leu Asp Thr Lys Gln Xaa Asn Lys Glu Val
              165   170   175

Gln Leu Arg Gly Ile Glu Xaa Ile Ala Gln Xaa Xaa Xaa Ser Asn Asp
              180   185   190

Val Xaa Tyr Ile Thr Ala Lys Pro Glu Tyr Lys Val Met Asn Asp Val
              195   200   205

Ala Arg Gly Ile Val Lys Ala Asp Val Ala Gln Ser Ser Tyr Gly Leu
210   215   220

Tyr Gly Gln Gly Gln Ile Val Ala Val Ala Asp Thr Gly Leu Asp Thr
225   230   235   240

Gly Arg Asn Asp Ser Ser Met His Glu Ala Phe Arg Gly Lys Ile Thr
245   250   255

Ala Leu Tyr Ala Leu Gly Arg Thr Asn Asn Ala Asn Asp Thr Asn Gly
260   265   270

His Gly Thr His Val Ala Gly Ser Val Leu Gly Asn Gly Xaa Thr Asn
275   280   285

Lys Gly Met Ala Pro Gln Ala Asn Leu Val Phe Gln Ser Ile Met Asp
290   295   300

Ser Xaa Gly Gly Leu Gly Gly Leu Pro Ser Asn Leu Gln Thr Leu Phe
305   310   315   320

Ser Gln Ala Xaa Ser Ala Gly Ala Arg Ile His Thr Asn Ser Trp Gly
325   330   335

Ala Ala Val Asn Gly Ala Tyr Thr Thr Asp Ser Arg Asn Val Asp Asp
340   345   350

Tyr Val Arg Lys Asn Asp Met Thr Ile Leu Phe Ala Ala Gly Asn Glu
355   360   365

Xaa Pro Asn Gly Gly Thr Ile Ser Ala Pro Gly Thr Ala Lys Asn Ala
370   375   380

Ile Thr Val Gly Ala Thr Glu Asn Leu Arg Pro Ser Phe Gly Ser Tyr
385   390   395   400

Ala Asp Asn Ile Asn His Val Ala Gln Phe Ser Ser Arg Gly Pro Thr
405   410   415

Lys Asp Gly Arg Ile Lys Pro Asp Val Met Ala Pro Gly Thr Xaa Ile
        420   425   430

Leu Ser Ala Arg Ser Ser Leu Ala Pro Asp Ser Ser Phe Trp Ala Asn
        435   440   445

His Asp Ser Lys Tyr Ala Tyr Met Gly Gly Thr Ser Met Ala Thr Pro
        450   455   460

Ile Val Ala Gly Asn Val Ala Gln Leu Arg Glu His Phe Val Lys Asn
465   470   475   480

Arg Gly Ile Thr Pro Lys Pro Ser Leu Leu Lys Ala Ala Leu Ile Ala
        485   490   495

Gly Ala Ala Asp Xaa Gly Leu Gly Tyr Pro Asn Gly Asn Gln Gly Trp
        500   505   510

Gly Arg Val Thr Leu Asp Lys Ser Leu Asn Val Ala Tyr Val Asn Glu
        515   520   525

Ser Ser Xaa Leu Ser Thr Ser Gln Lys Ala Thr Tyr Xaa Phe Thr Ala
        530   535   540

Thr Ala Gly Lys Pro Leu Lys Ile Ser Leu Val Trp Ser Asp Ala Pro
545   550   555   560

Ala Ser Thr Thr Ala Ser Val Thr Leu Val Asn Asp Leu Asp Leu Val
        565   570   575

Ile Thr Ala Pro Asn Gly Thr Xaa Tyr Val Gly Asn Asp Phe Xaa Xaa
        580   585   590

Pro Xaa Xaa Xaa Asn Trp Asp Gly Arg Asn Asn Val Glu Asn Val Phe
        595   600   605

Ile Asn Xaa Pro Gln Ser Gly Thr Tyr Thr Ile Glu Val Gln Ala Tyr
        610   615   620

Asn Val Pro Val Gly Pro Gln Xaa Phe Ser Leu Ala Ile Val Asn
625   630   635

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<211>   640

<212>   PRT

<213>   Bacillus sp.

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        149, 161, 166, 173, 184, 188, 189, 190, 195, 287, 307, 325, 370, 432, 502,
        532, 542, 585, 592, 593, 595, 596, 597, 612, 633

<223>   Xaa=arbitrary amino acid

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Met Arg Xaa Lys Lys Lys Val Phe Leu Ser Val Leu Ser Ala Ala Ala
1   5   10   15

Ile Leu Ser Thr Val Ala Leu Xaa Asn Pro Ser Ala Gly Xaa Ala Arg
                20   25   30

Xaa Phe Asp Leu Asp Phe Lys Gly Ile Gln Thr Thr Thr Asp Xaa Xaa
            35   40   45

Gly Phe Ser Lys Gln Xaa Gln Thr Gly Ala Ala Ala Phe Leu Val Glu
    50   55   60

Ser Glu Asn Val Lys Leu Xaa Lys Gly Leu Xaa Lys Lys Leu Glu Thr
65   70   75   80

Val Pro Ala Asn Asn Lys Leu His Ile Xaa Gln Phe Asn Gly Pro Ile

Leu Glu Glu Thr Lys Gln Xaa Leu Glu Xaa Thr Gly Ala Lys Ile Leu

Asp Tyr Ile Pro Asp Tyr Ala Tyr Ile Val Glu Tyr Glu Gly Asp Val

Xaa Ser Xaa Xaa Xaa Xaa Ile Glu His Val Glu Ser Val Glu Pro Tyr

Leu Pro Xaa Tyr Xaa Ile Asp Pro Gln Leu Phe Thr Lys Gly Ala Ser

Xaa Leu Val Lys Ala Xaa Ala Leu Asp Thr Lys Gln Xaa Asn Lys Glu

Val Gln Leu Arg Gly Ile Glu Xaa Ile Ala Gln Xaa Xaa Xaa Ser Asn

Asp Val Xaa Tyr Ile Thr Ala Lys Pro Glu Tyr Lys Val Met Asn Asp

Val Ala Arg Gly Ile Val Lys Ala Asp Val Ala Gln Ser Ser Tyr Gly

Leu Tyr Gly Gln Gly Gln Ile Val Ala Val Ala Asp Thr Gly Leu Asp

Thr Gly Arg Asn Asp Ser Ser Met His Glu Ala Phe Arg Gly Lys Ile

Thr Ala Leu Tyr Ala Leu Gly Arg Thr Asn Asn Ala Asn Asp Thr Asn

Gly His Gly Thr His Val Ala Gly Ser Val Leu Gly Asn Gly Xaa Thr

Asn Lys Gly Met Ala Pro Gln Ala Asn Leu Val Phe Gln Ser Ile Met

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        290              295              300
Asp Ser Xaa Gly Gly Leu Gly Gly Leu Pro Ser Asn Leu Gln Thr Leu
305              310              315              320
Phe Ser Gln Ala Xaa Ser Ala Gly Ala Arg Ile His Thr Asn Ser Trp
            325              330              335
Gly Ala Ala Val Asn Gly Ala Tyr Thr Thr Asp Ser Arg Asn Val Asp
            340              345              350
Asp Tyr Val Arg Lys Asn Asp Met Thr Ile Leu Phe Ala Ala Gly Asn
        355              360              365
Glu Xaa Pro Asn Gly Gly Thr Ile Ser Ala Pro Gly Thr Ala Lys Asn
    370              375              380
Ala Ile Thr Val Gly Ala Thr Glu Asn Leu Arg Pro Ser Phe Gly Ser
385              390              395              400
Tyr Ala Asp Asn Ile Asn His Val Ala Gln Phe Ser Ser Arg Gly Pro
            405              410              415
Thr Lys Asp Gly Arg Ile Lys Pro Asp Val Met Ala Pro Gly Thr Xaa
        420              425              430
Ile Leu Ser Ala Arg Ser Ser Leu Ala Pro Asp Ser Ser Phe Trp Ala
        435              440              445
Asn His Asp Ser Lys Tyr Ala Tyr Met Gly Gly Thr Ser Met Ala Thr
    450              455              460
Pro Ile Val Ala Gly Asn Val Ala Gln Leu Arg Glu His Phe Val Lys
465              470              475              480
Asn Arg Gly Ile Thr Pro Lys Pro Ser Leu Leu Lys Ala Ala Leu Ile
            485              490              495
Ala Gly Ala Ala Asp Xaa Gly Leu Gly Tyr Pro Asn Gly Asn Gln Gly
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              500                  505                  510
Trp Gly Arg Val Thr Leu Asp Lys Ser Leu Asn Val Ala Tyr Val Asn
              515                  520                  525
Glu Ser Ser Xaa Leu Ser Thr Ser Gln Lys Ala Thr Tyr Xaa Phe Thr
           530                  535                  540
Ala Thr Ala Gly Lys Pro Leu Lys Ile Ser Leu Val Trp Ser Asp Ala
545                  550                  555                  560
Pro Ala Ser Thr Thr Ala Ser Val Thr Leu Val Asn Asp Leu Asp Leu
                 565                  570                  575
Val Ile Thr Ala Pro Asn Gly Thr Xaa Tyr Val Gly Asn Asp Phe Xaa
              580                  585                  590
Xaa Pro Xaa Xaa Xaa Asn Trp Asp Gly Arg Asn Asn Val Glu Asn Val
              595                  600                  605
Phe Ile Asn Xaa Pro Gln Ser Gly Thr Tyr Thr Ile Glu Val Gln Ala
           610                  615                  620
Tyr Asn Val Pro Val Gly Pro Gln Xaa Phe Ser Leu Ala Ile Val Asn
625                  630                  635                  640
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<210> 3

<211> 1920

<212> DNA

<213> *Bacillus sp.*

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Met Arg Lys Lys Lys Val Phe Leu Ser Val Leu Ser Ala Ala Ala Ile
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  1                 5                      10                      15
ctg tcg act gtt gca tta aac aat ccc tcg gct ggt gat gca agg act    96
Leu Ser Thr Val Ala Leu Asn Asn Pro Ser Ala Gly Asp Ala Arg Thr
              20                    25                    30
ttt gat ctg gat ttt aaa gga att caa aca aca acc gat gtc agt ggt   144
Phe Asp Leu Asp Phe Lys Gly Ile Gln Thr Thr Thr Asp Val Ser Gly
           35                    40                    45
ttc tcc aaa cag cga caa aca ggt gcg gct gca ttt ctg gtg gag tct   192
Phe Ser Lys Gln Arg Gln Thr Gly Ala Ala Ala Phe Leu Val Glu Ser
           50                    55                    60
gaa aat gtg aaa ctt ctt aaa gga ttg cta aag aaa ctt gaa aca gta   240
Glu Asn Val Lys Leu Leu Lys Gly Leu Leu Lys Lys Leu Glu Thr Val
65                    70                    75                    80
ccg gca aat aat aaa ctc cat att gtc caa ttc aat ggc ccc att tta   288
Pro Ala Asn Asn Lys Leu His Ile Val Gln Phe Asn Gly Pro Ile Leu
                 85                    90                    95
gaa gaa aca aaa cag aag cta gag aca act gga gca aag att ctc gac   336
Glu Glu Thr Lys Gln Lys Leu Glu Thr Thr Gly Ala Lys Ile Leu Asp
              100                   105                   110
tac atc cct gat tat gca tat att gtc gag tat gag ggg gat gtt cag   384
Tyr Ile Pro Asp Tyr Ala Tyr Ile Val Glu Tyr Glu Gly Asp Val Gln
           115                   120                   125
tca aaa gtc cgc tcc att gaa cac gtg gaa tca gtg gag cca tac ttg   432
Ser Lys Val Arg Ser Ile Glu His Val Glu Ser Val Glu Pro Tyr Leu
        130                   135                   140
ccg aaa tac aaa ata gat ccc cag ctt ttc aca aaa ggc gca tcg acg   480
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Pro Lys Tyr Lys Ile Asp Pro Gln Leu Phe Thr Lys Gly Ala Ser Thr
145   150   155   160

ctg gtg aaa gcg ttg gcg ctt gat acg aag cag aac aat aaa gaa gtg   528
Leu Val Lys Ala Leu Ala Leu Asp Thr Lys Gln Asn Asn Lys Glu Val
                 165   170   175

caa tta aga ggc atc gag gaa atc gct cag tac gta gca agc aat gac   576
Gln Leu Arg Gly Ile Glu Glu Ile Ala Gln Tyr Val Ala Ser Asn Asp
                 180   185   190

gtc cat tat att acg gca aag cct gaa tat aag gtg atg aat gat gtg   624
Val His Tyr Ile Thr Ala Lys Pro Glu Tyr Lys Val Met Asn Asp Val
                 195   200   205

gcc aga ggt att gtc aaa gcg gat gtg gca cag agc agc tac ggt ttg   672
Ala Arg Gly Ile Val Lys Ala Asp Val Ala Gln Ser Ser Tyr Gly Leu
     210   215   220

tat gga caa ggc cag att gtc gca gtt gcc gat act gga ttg gat aca   720
Tyr Gly Gln Gly Gln Ile Val Ala Val Ala Asp Thr Gly Leu Asp Thr
225   230   235   240

gga aga aac gac agt tcg atg cat gaa gcc ttc cgc ggt aaa ata aca   768
Gly Arg Asn Asp Ser Ser Met His Glu Ala Phe Arg Gly Lys Ile Thr
                 245   250   255

gca cta tat gca ctg ggt cgg acg aat aat gcg aat gat acg aac ggt   816
Ala Leu Tyr Ala Leu Gly Arg Thr Asn Asn Ala Asn Asp Thr Asn Gly
                 260   265   270

cat ggt acc cat gtg gca ggt tcg gta tta gga aat ggc gca acg aat   864
His Gly Thr His Val Ala Gly Ser Val Leu Gly Asn Gly Ala Thr Asn
                 275   280   285

aaa gga atg gca cct caa gcg aat ctg gtt ttt caa tcc atc atg gat 912
Lys Gly Met Ala Pro Gln Ala Asn Leu Val Phe Gln Ser Ile Met Asp
        290   295   300

agc agt ggt ggg ctt gga ggc ttg cct tcc aat ctg caa acc tta ttc 960
Ser Ser Gly Gly Leu Gly Gly Leu Pro Ser Asn Leu Gln Thr Leu Phe
305   310   315   320

agc caa gca ttc agt gca ggt gcc aga att cat aca aac tcc tgg ggg 1008
Ser Gln Ala Phe Ser Ala Gly Ala Arg Ile His Thr Asn Ser Trp Gly
            325   330   335

gca gcg gtg aat ggg gcc tac acg aca gat tcc aga aat gtg gat gac 1056
Ala Ala Val Asn Gly Ala Tyr Thr Thr Asp Ser Arg Asn Val Asp Asp
            340   345   350

tat gta agg aaa aat gat atg acg att ctt ttc gcg gct ggg aat gaa 1104
Tyr Val Arg Lys Asn Asp Met Thr Ile Leu Phe Ala Ala Gly Asn Glu
            355   360   365

agg ccg aac ggc ggt acc atc agt gca cct ggt acg gct aaa aac gcc 1152
Arg Pro Asn Gly Gly Thr Ile Ser Ala Pro Gly Thr Ala Lys Asn Ala
        370   375   380

ata aca gtc ggc gca acc gaa aac ctg cgt cca agc ttc ggt tcc tat 1200
Ile Thr Val Gly Ala Thr Glu Asn Leu Arg Pro Ser Phe Gly Ser Tyr
385   390   395   400

gca gat aat att aac cac gtt gca cag ttc tct tcc cgt ggc ccg aca 1248
Ala Asp Asn Ile Asn His Val Ala Gln Phe Ser Ser Arg Gly Pro Thr
            405   410   415

aaa gat ggg cga atc aag cct gat gtc atg gcg cca ggg aca tac att 1296
Lys Asp Gly Arg Ile Lys Pro Asp Val Met Ala Pro Gly Thr Tyr Ile

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                420                      425                      430
tta tca gca aga tct tct ctt gca ccc gat tcc tcc ttc tgg gcg aat  1344
Leu Ser Ala Arg Ser Ser Leu Ala Pro Asp Ser Ser Phe Trp Ala Asn
                   435                      440                      445
cat gac agc aaa tat gcc tat atg ggt gga acg tcc atg gca aca ccg  1392
His Asp Ser Lys Tyr Ala Tyr Met Gly Gly Thr Ser Met Ala Thr Pro
        450                      455                      460
att gtt gcg ggg aat gtt gca cag ctc cgt gag cat ttt gtg aaa aat  1440
Ile Val Ala Gly Asn Val Ala Gln Leu Arg Glu His Phe Val Lys Asn
    465                      470                      475                      480
aga gga atc act cct aag cct tcc cta ttg aaa gca gct ttg att gca  1488
Arg Gly Ile Thr Pro Lys Pro Ser Leu Leu Lys Ala Ala Leu Ile Ala
                   485                      490                      495
ggt gct gct gat gtt gga ttg ggt tat ccg aac gga aac caa gga tgg  1536
Gly Ala Ala Asp Val Gly Leu Gly Tyr Pro Asn Gly Asn Gln Gly Trp
        500                      505                      510
ggc cga gtg acc ctg gat aaa tcg ttg aac gtt gcc tat gtg aac gaa  1584
Gly Arg Val Thr Leu Asp Lys Ser Leu Asn Val Ala Tyr Val Asn Glu
        515                      520                      525
tcc agt gcc cta tca act agc caa aaa gcg aca tat acc ttt act gca  1632
Ser Ser Ala Leu Ser Thr Ser Gln Lys Ala Thr Tyr Thr Phe Thr Ala
        530                      535                      540
acg gcg ggc aag cca ttg aaa atc tcc ctg gta tgg tcg gat gcc cct  1680
Thr Ala Gly Lys Pro Leu Lys Ile Ser Leu Val Trp Ser Asp Ala Pro
545                      550                      555                      560
gca agc act act gct tct gta acc ctg gtc aat gat ttg gat ttg gtc  1728
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Ala Ser Thr Thr Ala Ser Val Thr Leu Val Asn Asp Leu Asp Leu Val
          565   570   575

att aca gca cca aac gga aca aga tat gtc ggg aat gac ttc tca gca 1776
Ile Thr Ala Pro Asn Gly Thr Arg Tyr Val Gly Asn Asp Phe Ser Ala
          580   585   590

cca ttt gac aat aac tgg gat ggc cgc aat aac gta gaa aat gta ttt 1824
Pro Phe Asp Asn Asn Trp Asp Gly Arg Asn Asn Val Glu Asn Val Phe
        595   600   605

att aat tcg ccc caa agt gga aca tat acc att gag gtg caa gca tat 1872
Ile Asn Ser Pro Gln Ser Gly Thr Tyr Thr Ile Glu Val Gln Ala Tyr
       610   615   620

aat gtg ccg gtt gga cca caa aac ttc tcg ttg gca att gtg aac taa 1920
Asn Val Pro Val Gly Pro Gln Asn Phe Ser Leu Ala Ile Val Asn
625   630   635

<210> 4
<211> 1923
<212> DNA
<213> *Bacillus sp.*

<400>
atg aga aag aag aaa aag gtg ttt tta tct gtt tta tca gct gca gcg 48
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1   5   10   15

att ttg tcg act gtt gcg tta agt aat cca tct gca ggt ggt gca agg 96
Ile Leu Ser Thr Val Ala Leu Ser Asn Pro Ser Ala Gly Gly Ala Arg

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                    20                      25                        30
aat ttt gat ctg gat ttc aaa gga att cag aca aca act gat gct aaa   144
Asn Phe Asp Leu Asp Phe Lys Gly Ile Gln Thr Thr Thr Asp Ala Lys
            35                    40                    45
ggt ttc tcc aag cag ggg cag act ggt gct gct gct ttt ctg gtg gaa   192
Gly Phe Ser Lys Gln Gly Gln Thr Gly Ala Ala Ala Phe Leu Val Glu
        50                    55                    60
tct gaa aat gtg aaa ctc cca aaa ggt ttg cag aag aag ctt gaa aca   240
Ser Glu Asn Val Lys Leu Pro Lys Gly Leu Gln Lys Lys Leu Glu Thr
65                    70                    75                    80
gtc ccg gca aat aat aaa ctc cat att atc caa ttc aat gga cca att   288
Val Pro Ala Asn Asn Lys Leu His Ile Ile Gln Phe Asn Gly Pro Ile
                    85                    90                    95
tta gaa gaa aca aaa cag cag ctg gaa aaa aca ggg gca aag att ctc   336
Leu Glu Glu Thr Lys Gln Gln Leu Glu Lys Thr Gly Ala Lys Ile Leu
                100                   105                   110
gac tac ata cct gat tat gct tac att gtc gag tat gag ggc gat gtt   384
Asp Tyr Ile Pro Asp Tyr Ala Tyr Ile Val Glu Tyr Glu Gly Asp Val
            115                   120                   125
aag tca gca aca agc acc att gag cac gtg gaa tcc gtg gag cct tat   432
Lys Ser Ala Thr Ser Thr Ile Glu His Val Glu Ser Val Glu Pro Tyr
        130                   135                   140
ttg ccg ata tac aga ata gat ccc cag ctt ttc aca aaa ggg gca tca   480
Leu Pro Ile Tyr Arg Ile Asp Pro Gln Leu Phe Thr Lys Gly Ala Ser
145                   150                   155                   160
gag ctt gta aaa gca gtg gcg ctt gat aca aag cag aaa aat aaa gag   528
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Glu Leu Val Lys Ala Val Ala Leu Asp Thr Lys Gln Lys Asn Lys Glu
             165   170   175

gtg caa tta aga ggc atc gaa caa atc gca caa ttc gca ata agc aat 576
Val Gln Leu Arg Gly Ile Glu Gln Ile Ala Gln Phe Ala Ile Ser Asn
             180   185   190

gat gtg cta tat att acg gca aag cct gag tat aag gtg atg aat gat 624
Asp Val Leu Tyr Ile Thr Ala Lys Pro Glu Tyr Lys Val Met Asn Asp
            195   200   205

gtt gcg cgt gga att gtc aaa gcg gat gtg gct cag agc agc tac ggg 672
Val Ala Arg Gly Ile Val Lys Ala Asp Val Ala Gln Ser Ser Tyr Gly
     210   215   220

ttg tat gga caa gga cag atc gta gcg gtt gcc gat aca ggg ctt gat 720
Leu Tyr Gly Gln Gly Gln Ile Val Ala Val Ala Asp Thr Gly Leu Asp
225   230   235   240

aca ggt cgc aat gac agt tcg atg cat gaa gcc ttc cgc ggg aaa att 768
Thr Gly Arg Asn Asp Ser Ser Met His Glu Ala Phe Arg Gly Lys Ile
            245   250   255

act gca tta tat gca ttg gga cgg acg aat aat gcc aat gat acg aat 816
Thr Ala Leu Tyr Ala Leu Gly Arg Thr Asn Asn Ala Asn Asp Thr Asn
            260   265   270

ggt cat ggt acg cat gtg gct ggc tcc gta tta gga aac ggc tcc act 864
Gly His Gly Thr His Val Ala Gly Ser Val Leu Gly Asn Gly Ser Thr
            275   280   285

aat aaa gga atg gcg cct cag gcg aat cta gtc ttc caa tct atc atg 912
Asn Lys Gly Met Ala Pro Gln Ala Asn Leu Val Phe Gln Ser Ile Met
    290   295   300

gat agc ggt ggg gga ctt gga gga cta cct tcg aat ctg caa acc tta 960
Asp Ser Gly Gly Gly Leu Gly Gly Leu Pro Ser Asn Leu Gln Thr Leu
305   310   315   320

ttc agc caa gca tac agt gct ggt gcc aga att cat aca aac tcc tgg 1008
Phe Ser Gln Ala Tyr Ser Ala Gly Ala Arg Ile His Thr Asn Ser Trp
            325   330   335

gga gca gca gtg aat ggg gct tac aca aca gat tcc aga aat gtg gat 1056
Gly Ala Ala Val Asn Gly Ala Tyr Thr Thr Asp Ser Arg Asn Val Asp
                340   345   350

gac tat gtg cgc aaa aat gat atg acg atc ctt ttc gct gcc ggg aat 1104
Asp Tyr Val Arg Lys Asn Asp Met Thr Ile Leu Phe Ala Ala Gly Asn
            355   360   365

gaa gga ccg aac ggc gga acc atc agt gca cca ggc aca gct aaa aat 1152
Glu Gly Pro Asn Gly Gly Thr Ile Ser Ala Pro Gly Thr Ala Lys Asn
        370   375   380

gca ata aca gtc gga gct acg gaa aac ctc cgc cca agc ttt ggg tct 1200
Ala Ile Thr Val Gly Ala Thr Glu Asn Leu Arg Pro Ser Phe Gly Ser
385   390   395   400

tat gcg gac aat atc aac cat gtg gca cag ttc tct tca cgt gga ccg 1248
Tyr Ala Asp Asn Ile Asn His Val Ala Gln Phe Ser Ser Arg Gly Pro
                405   410   415

aca aag gat gga cgg atc aaa ccg gat gtc atg gca ccg gga acg ttc 1296
Thr Lys Asp Gly Arg Ile Lys Pro Asp Val Met Ala Pro Gly Thr Phe
            420   425   430

ata cta tca gca aga tct tct ctt gca ccg gat tcc tcc ttc tgg gcg 1344
Ile Leu Ser Ala Arg Ser Ser Leu Ala Pro Asp Ser Ser Phe Trp Ala

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            435                    440                      445
aac cat gac agt aaa tat gca tac atg ggt gga acg tcc atg gct aca 1392
Asn His Asp Ser Lys Tyr Ala Tyr Met Gly Gly Thr Ser Met Ala Thr
        450                    455                      460
ccg atc gtt gct gga aac gtg gca cag ctt cgt gag cat ttt gtg aaa 1440
Pro Ile Val Ala Gly Asn Val Ala Gln Leu Arg Glu His Phe Val Lys
465                    470                      475                      480
aac aga ggc atc aca cca aag cct tct cta tta aaa gcg gca ctg att 1488
Asn Arg Gly Ile Thr Pro Lys Pro Ser Leu Leu Lys Ala Ala Leu Ile
                485                    490                      495
gcc ggt gca gct gac atc ggc ctt ggc tac ccg aac ggt aac caa gga 1536
Ala Gly Ala Ala Asp Ile Gly Leu Gly Tyr Pro Asn Gly Asn Gln Gly
                500                    505                      510
tgg gga cga gtg aca ttg gat aaa tcc ctg aac gtt gcc tat gtg aac 1584
Trp Gly Arg Val Thr Leu Asp Lys Ser Leu Asn Val Ala Tyr Val Asn
        515                    520                      525
gag tcc agt tct cta tcc acc agc caa aaa gcg acg tac tcg ttt act 1632
Glu Ser Ser Ser Leu Ser Thr Ser Gln Lys Ala Thr Tyr Ser Phe Thr
        530                    535                      540
gct act gcc ggc aag cct ttg aaa atc tcc ctg gta tgg tct gat gcc 1680
Ala Thr Ala Gly Lys Pro Leu Lys Ile Ser Leu Val Trp Ser Asp Ala
545                    550                      555                      560
cct gcg agc aca act gct tcc gta acg ctt gtc aat gat ctg gac ctt 1728
Pro Ala Ser Thr Thr Ala Ser Val Thr Leu Val Asn Asp Leu Asp Leu
                565                    570                      575
gtc att acc gct cca aat ggc aca cag tat gta gga aat gac ttt act 1776
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Val Ile Thr Ala Pro Asn Gly Thr Gln Tyr Val Gly Asn Asp Phe Thr
    580   585   590

tcg cca tac aat gat aac tgg gat ggc cgc aat aac gta gaa aat gta 1824
Ser Pro Tyr Asn Asp Asn Trp Asp Gly Arg Asn Asn Val Glu Asn Val
    595   600   605

ttt att aat gca cca caa agc ggg acg tat aca att gag gta cag gct 1872
Phe Ile Asn Ala Pro Gln Ser Gly Thr Tyr Thr Ile Glu Val Gln Ala
   610   615   620

tat aac gta ccg gtt gga cca cag acc ttc tcg ttg gca att gtg aat 1920
Tyr Asn Val Pro Val Gly Pro Gln Thr Phe Ser Leu Ala Ile Val Asn
625   630   635   640

taa   1923

<210> 5

<211> 1923

<212> DNA

<212> *Bacillus sp.*

<400>

atg aga aag aag aaa aag gtg ttt tta tct gtt tta tca gct gca gcg 48
Met Arg Lys Lys Lys Lys Val Phe Leu Ser Val Leu Ser Ala Ala Ala
      5   10   15

att ttg tcg act gtt gcg tta agt aat cca tct gca ggt ggt gca agg 96
Ile Leu Ser Thr Val Ala Leu Ser Asn Pro Ser Ala Gly Gly Ala Arg
    20   25   30

aat ttt gat ctg gat ttc aaa gga att cag aca aca act gat gct aaa 144

Asn Phe Asp Leu Asp Phe Lys Gly Ile Gln Thr Thr Thr Asp Ala Lys

    35   40   45

ggt ttc tcc aag cag ggg cag act ggt gct gct gct ttt ctg gtg gaa   192

Gly Phe Ser Lys Gln Gly Gln Thr Gly Ala Ala Ala Phe Leu Val Glu

    50   55   60

tct gaa aat gtg aaa ctc cca aaa ggt ttg cag aag aag ctt gaa aca   240

Ser Glu Asn Val Lys Leu Pro Lys Gly Leu Gln Lys Lys Leu Glu Thr

65   70   75   80

gtc ccg gca aat aat aaa ctc cat att atc caa ttc aat gga cca att   288

Val Pro Ala Asn Asn Lys Leu His Ile Ile Gln Phe Asn Gly Pro Ile

          85   90   95

tta gaa gaa aca aaa cag cag ctg gaa aaa aca ggg gca aag att ctc   336

Leu Glu Glu Thr Lys Gln Gln Leu Glu Lys Thr Gly Ala Lys Ile Leu

         100   105   110

gac tac ata cct gat tat gct tac att gtc gag tat gag ggc gat gtt   384

Asp Tyr Ile Pro Asp Tyr Ala Tyr Ile Val Glu Tyr Glu Gly Asp Val

         115   120   125

aag tca gca aca agc acc att gag cac gtg gaa tcc gtg gag cct tat   432

Lys Ser Ala Thr Ser Thr Ile Glu His Val Glu Ser Val Glu Pro Tyr

      130   135   140

ttg ccg ata tac aga ata gat ccc cag ctt ttc aca aaa ggg gca tca   480

Leu Pro Ile Tyr Arg Ile Asp Pro Gln Leu Phe Thr Lys Gly Ala Ser

145   150   155   160

gag ctt gta aaa gca gtg gcg ctt gat aca aag cag aaa aat aaa gag   528

Glu Leu Val Lys Ala Val Ala Leu Asp Thr Lys Gln Lys Asn Lys Glu

      165   170   175

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gtg caa tta aga ggc atc gaa caa atc gca caa ttc gca ata agc aat   576
Val Gln Leu Arg Gly Ile Glu Gln Ile Ala Gln Phe Ala Ile Ser Asn
               180              185              190

gat gtg cta tat att acg gca aag cct gag tat aag gtg atg aat gat   624
Asp Val Leu Tyr Ile Thr Ala Lys Pro Glu Tyr Lys Val Met Asn Asp
            195              200              205

gtt gcg cgt gga att gtc aaa gcg gat gtg gct cag agc agc tac ggg   672
Val Ala Arg Gly Ile Val Lys Ala Asp Val Ala Gln Ser Ser Tyr Gly
         210              215              220

ttg tat gga caa gga cag atc gta gcg gtt gcc gat aca ggg ctt gat   720
Leu Tyr Gly Gln Gly Gln Ile Val Ala Val Ala Asp Thr Gly Leu Asp
225              230              235              240

aca ggt cgc aat gac agt tcg atg cat gaa gcc ttc cgc ggg aaa att   768
Thr Gly Arg Asn Asp Ser Ser Met His Glu Ala Phe Arg Gly Lys Ile
               245              250              255

act gca tta tat gca ttg gga cgg acg aat aat gcc aat gat acg aat   816
Thr Ala Leu Tyr Ala Leu Gly Arg Thr Asn Asn Ala Asn Asp Thr Asn
            260              265              270

ggt cat ggt acg cat gtg gct ggc tcc gta tta gga aac ggc tcc act   864
Gly His Gly Thr His Val Ala Gly Ser Val Leu Gly Asn Gly Ser Thr
            275              280              285

aat aaa gga atg gcg cct cag gcg aat cta gtc ttc caa tct atc atg   912
Asn Lys Gly Met Ala Pro Gln Ala Asn Leu Val Phe Gln Ser Ile Met
            290              295              300

gat agc ggt ggg gga ctt gga gga cta cct tcg aat ctg caa acc tta   960
Asp Ser Gly Gly Gly Leu Gly Gly Leu Pro Ser Asn Leu Gln Thr Leu
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          305                      310                      315                      320
ttc agc caa gca tac agt gct ggt gcc aga att cat aca aac tcc tgg 1008
Phe Ser Gln Ala Tyr Ser Ala Gly Ala Arg Ile His Thr Asn Ser Trp
                         325                      330                      335
gga gca gca gtg aat ggg gct tac aca aca gat tcc aga aat gtg gat 1056
Gly Ala Ala Val Asn Gly Ala Tyr Thr Thr Asp Ser Arg Asn Val Asp
                340                      345                      350
gac tat gtg cgc aaa aat gat atg acg atc ctt ttc gct gcc ggg aat 1104
Asp Tyr Val Arg Lys Asn Asp Met Thr Ile Leu Phe Ala Ala Gly Asn
           355                      360                      365
gaa gga ccg aac ggc gga acc atc agt gca cca ggc aca gct aaa aat 1152
Glu Gly Pro Asn Gly Gly Thr Ile Ser Ala Pro Gly Thr Ala Lys Asn
           370                      375                      380
gca ata aca gtc gga gct acg gaa aac ctc cgc cca agc ttt ggg tct 1200
Ala Ile Thr Val Gly Ala Thr Glu Asn Leu Arg Pro Ser Phe Gly Ser
385                      390                      395                      400
tat gcg gac aat atc aac cat gtg gca cag ttc tct tca cgt gga ccg 1248
Tyr Ala Asp Asn Ile Asn His Val Ala Gln Phe Ser Ser Arg Gly Pro
                    405                      410                      415
aca aag gat gga cgg atc aaa ccg gat gtc atg gca ccg gga acg ttc 1296
Thr Lys Asp Gly Arg Ile Lys Pro Asp Val Met Ala Pro Gly Thr Phe
                420                      425                      430
ata cta tca gca aga tct tct ctt gca ccg gat tcc tcc ttc tgg gcg 1344
Ile Leu Ser Ala Arg Ser Ser Leu Ala Pro Asp Ser Ser Phe Trp Ala
           435                      440                      445
aac cat gac agt aaa tat gca tac atg ggt gga acg tcc atg gct aca 1392
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Asn His Asp Ser Lys Tyr Ala Tyr Met Gly Gly Thr Ser Met Ala Thr

450 455 460

ccg atc gtt gct gga aac gtg gca cag ctt cgt gag cat ttt gtg aaa 1440

Pro Ile Val Ala Gly Asn Val Ala Gln Leu Arg Glu His Phe Val Lys

465 470 475 480

aac aga ggc atc aca cca aag cct tct cta tta aaa gcg gca ctg att 1488

Asn Arg Gly Ile Thr Pro Lys Pro Ser Leu Leu Lys Ala Ala Leu Ile

485 490 495

gcc ggt gca gct gac atc ggc ctt ggc tac ccg aac ggt aac caa gga 1536

Ala Gly Ala Ala Asp Ile Gly Leu Gly Tyr Pro Asn Gly Asn Gln Gly

500 505 510

tgg gga cga gtg aca ttg gat aaa tcc ctg aac gtt gcc tat gtg aac 1584

Trp Gly Arg Val Thr Leu Asp Lys Ser Leu Asn Val Ala Tyr Val Asn

515 520 525

gag tcc agt tct cta tcc acc agc caa aaa gcg acg tac tcg ttt act 1632

Glu Ser Ser Ser Leu Ser Thr Ser Gln Lys Ala Thr Tyr Ser Phe Thr

530 535 540

gct act gcc ggc aag cct ttg aaa atc tcc ctg gta tgg tct gat gcc 1680

Ala Thr Ala Gly Lys Pro Leu Lys Ile Ser Leu Val Trp Ser Asp Ala

545 550 555 560

cct gcg agc aca act gct tcc gta acg ctt gtc aat gat ctg gac ctt 1728

Pro Ala Ser Thr Thr Ala Ser Val Thr Leu Val Asn Asp Leu Asp Leu

565 570 575

gtc att acc gct cca aat ggc aca cag tat gta gga aat gac ttt act 1776

Val Ile Thr Ala Pro Asn Gly Thr Gln Tyr Val Gly Asn Asp Phe Thr

580 585 590

tcg cca tac aat gat aac tgg gat ggc cgc aat aac gta gaa aat gta 1824
Ser Pro Tyr Asn Asp Asn Trp Asp Gly Arg Asn Asn Val Glu Asn Val
           595   600   605
ttt att aat gca cca caa agc ggg acg tat aca att gaa gta cag gct 1872
Phe Ile Asn Ala Pro Gln Ser Gly Thr Tyr Thr Ile Glu Val Gln Ala
           610   615   620
tat aac gta ccg gtt gga cca cag aac ttc tcg ttg gca att gtg aat 1920
Tyr Asn Val Pro Val Gly Pro Gln Asn Phe Ser Leu Ala Ile Val Asn
625   630   635   640
taa   1923